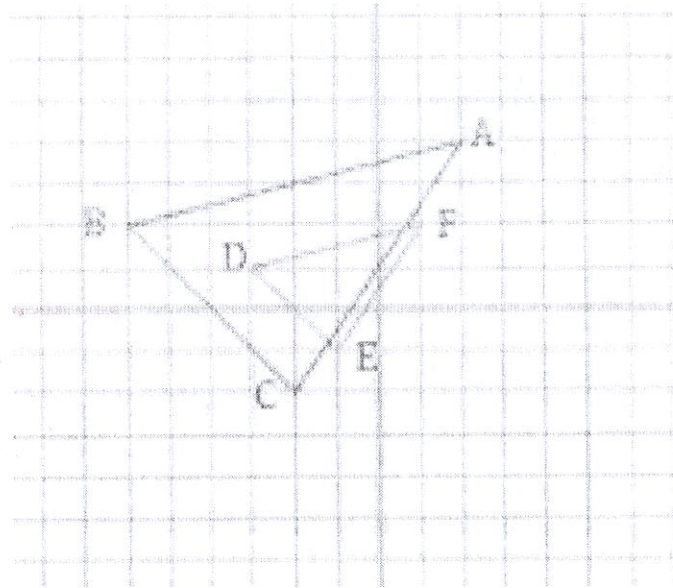


Name: _____

Date: _____

Per.: _____

4.5 Dilation

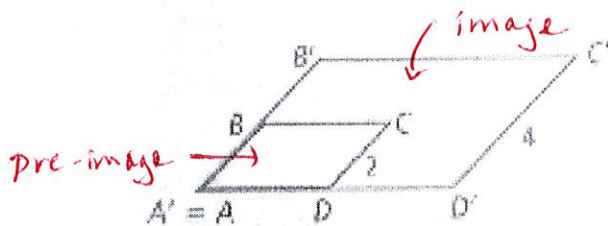


*Dilation is a Similarity transformation.

*Dilation keeps angle measures \cong and sides proportional.

Example 1

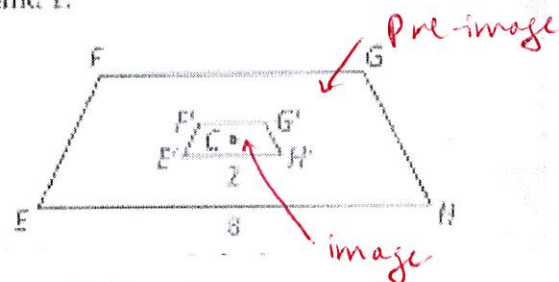
A dilation is an **enlargement** if the scale factor n is greater than 1. The dilation is a **reduction** if the scale factor n is between 0 and 1.



Enlargement

Scale factor: $\frac{4}{2}$ ← image
← pre-image

↓
simplifies to $\boxed{2}$



Reduction

Scale factor: $\frac{2}{8}$ ← image
← pre-image

↓
 $\boxed{\frac{1}{4}}$

Example 2

*ABCDE is the pre-image
A'B'C'D'E' is the image*

Draw the image of the pentagon after a dilation with
scale factor $\frac{3}{2}$

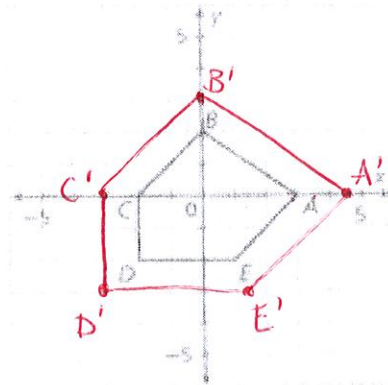
- A In the table below, list the vertices of the pentagon. Then use the rule for the dilation to write the vertices of the image.

Pre-Image (x, y)	Image ($\frac{3}{2}x, \frac{3}{2}y$)
A(3, 0)	A'(4.5, 0)
B(0, 2)	B'(0, 3)
C(-2, 0)	C'(-3, 0)
D(-2, -2)	D'(-3, -3)
E(1, -2)	E'($\frac{3}{2}$, -3)

*Multiply the x- and y-coordinates by the
scale factor ($\frac{3}{2}$)!*

$$C(-2, 0) \quad \frac{-2 \cdot \frac{3}{2}}{1} = \frac{-6}{2} = -3 \quad C'(-3, 0)$$

$$0 \cdot \frac{3}{2} = 0$$

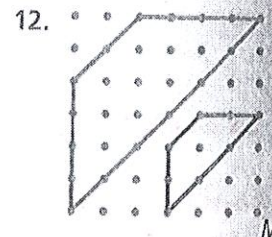
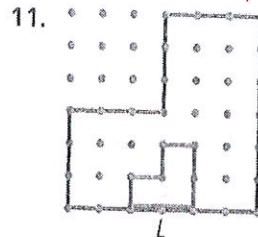
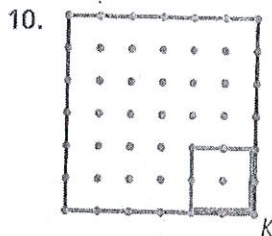
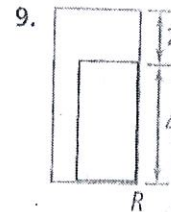
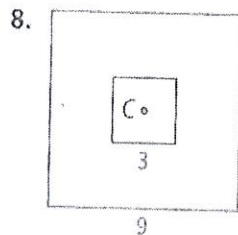
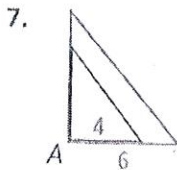


- B Plot the vertices of the image. Connect the vertices to complete the image.

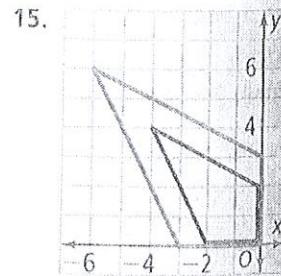
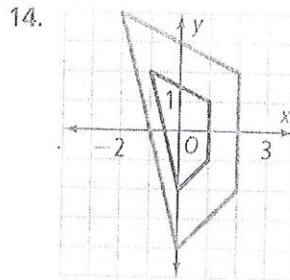
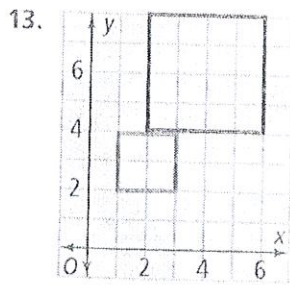
Practice

The blue figure is a dilation image of the black figure. The labeled point is the center of dilation. Tell whether the dilation is an enlargement or a reduction. Then find the scale factor of the dilation.

See Problem

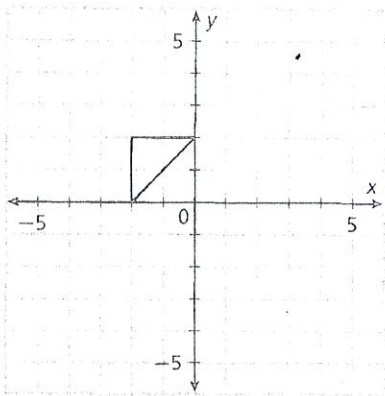


CHALLENGE!

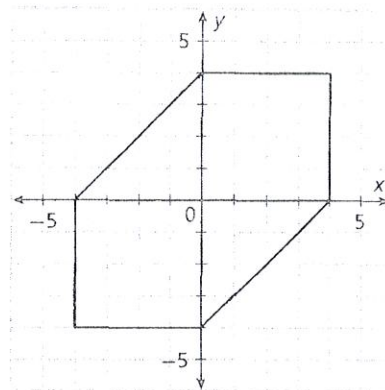


Draw the image of the figure after a dilation with the given scale factor.

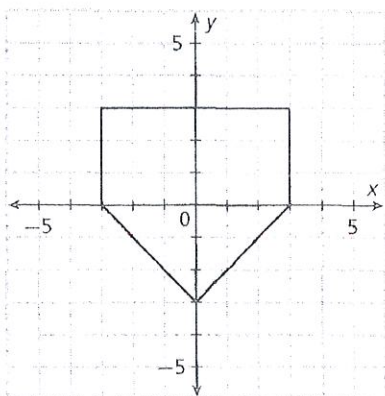
3. scale factor: 2



4. scale factor: $\frac{1}{4}$



5. scale factor: $\frac{2}{3}$



6. scale factor: 3

